



First records of Pantophthalmidae (Diptera, Brachycera) from Roraima state, Brazil

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Abstract

Although Pantophthalmidae is widely distributed in Brazil, in some regions, such as the Amazon basin, there is a dearth of studies on the family. In this work, we record the occurrence of *Pantophthalmus chuni* (Enderlein, 1912) and *Pantophthalmus comptus* Enderlein, 1912 for the state of Roraima for the first time. In addition, we provide distribution maps and photographs of the species.

Key words

Distribution, Neotropical region, *Pantophthalmus*, timber flies.

Academic editor: Fabio Laurindo da Silva | Received 5 November 2018 | Accepted 14 January 2019 | Published 8 February 2019

Citation: Barros LM, Soares MMM, Ale-Rocha R (2018) First records of Pantophthalmidae (Diptera, Brachycera) from Roraima state, Brazil. Check List 15 (1): 169–174. <https://doi.org/10.15560/15.1.169>

Introduction

Pantophthalmidae is a small family of flies belonging to the suborder Brachycera and confined to the Neotropical region, occurring from Mexico to Argentina. The family is composed of 20 species belonging to 2 genera: the monotypic *Opetiops* Enderlein, 1921 and *Pantophthalmus* Thunberg, 1819, which comprises the remaining 19 species (Val 1976). Timber flies tend to be rare and scarcely present in entomological collections (Pujol-Luz and Morgado 2018).

Morphologically, they are easily recognized as being large, robust flies, coloured in dark brown and reddish shades, measuring 18–45 mm in body length, and usually possessing longitudinal stripes on the mesonotum. Males have holoptic eyes, while females have dichoptic

eyes that occupy a large portion of the head. The wings are hyaline with yellow or brown spots, and the face bears a conical protuberance, similar to a “beak” of varied size and shape (Woodley 2009). The larvae of Pantophthalmidae pierce living or dead trees to form galleries, in which they probably feed on fresh or fermented organic matter. The immature stage has been formally described for 5 *Pantophthalmus* species only (Pujol-Luz and Pujol-Luz 2014).

The most complete work on timber flies was conducted by Val (1976), who provided identification keys for males and females, illustrations, diagnoses, and tested the phylogenetic relationships of the known species. Additionally, Papavero (2009) compiled a list of all trees that host timber fly juveniles. In Brazil, Pantophthalmidae has been recorded from the states of Acre,

Amazonas, Amapá, Bahia, Espírito Santo, Goiás, Maranhão, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Rio de Janeiro, Rio Grande do Sul, Rondônia, São Paulo and Santa Catarina (Fachin 2018), in biomes of Amazon, Atlantic Forest, Cerrado, and Pantanal.

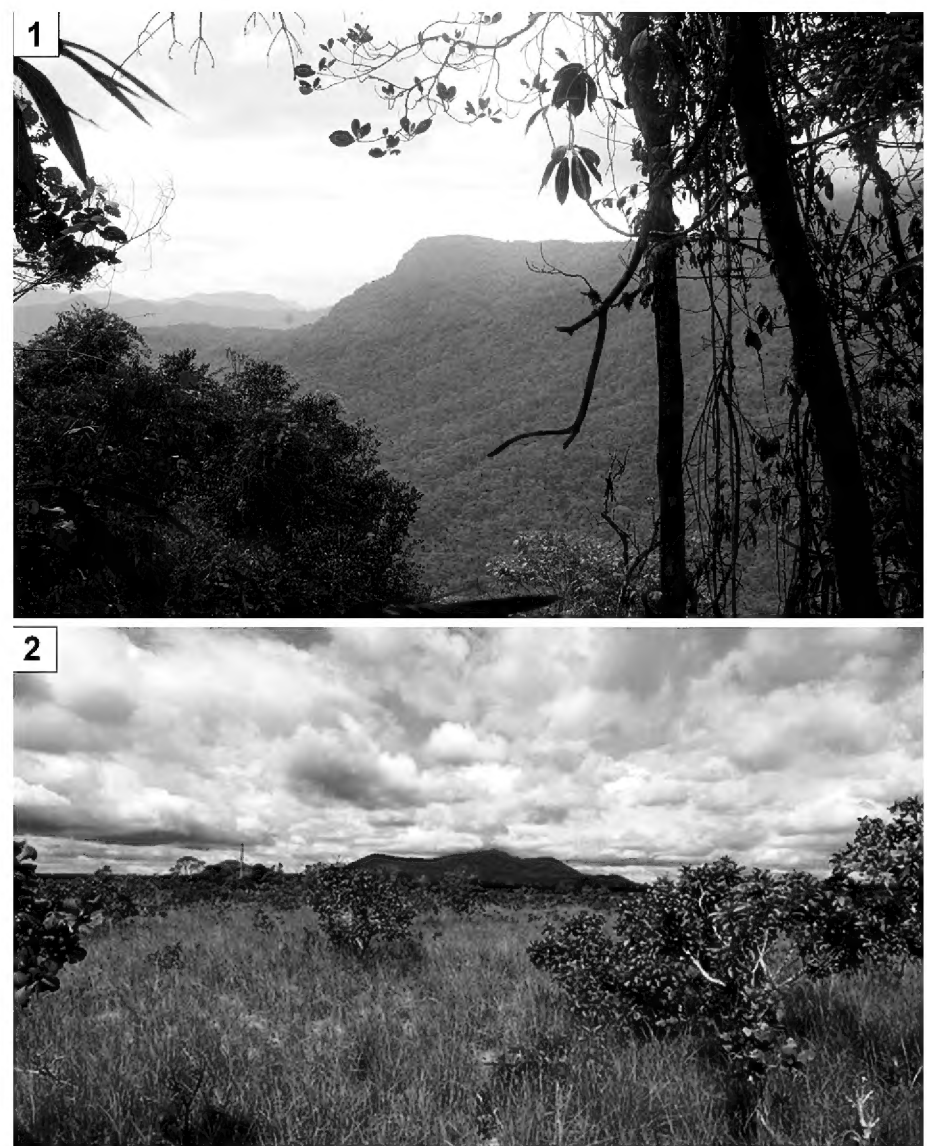
Pantophthalmus chuni (Enderlein, 1912) was described from 2 females collected in Chanchamayo, Peru. It is currently recorded from Argentina, Brazil (states of Amazonas and Pará), Bolivia, Colombia, Ecuador, French Guiana and Peru (Lunz et al. 2010, Wolf et al. 2016, Pujol-Luz and Morgado 2018). *Pantophthalmus comptus* Enderlein, 1912 was described from 1 female and its type locality is roughly given as “South America”. It currently has records from Argentina, Belize, Brazil (states of Amazonas and Pará), Bolivia, Colombia, Ecuador, Guyana and Peru (Val 1976, Wolff et al. 2016).

During the scientific expedition entitled “Biodiversity of the Serra da Mocidade”, in the northern Brazil, some specimens of *Pantophthalmus* were collected. In this contribution, we present, for the first time, records of Pantophthalmidae from the state of Roraima, Brazil, through the identification of *P. comptus* and *P. chuni*, thereby upgrading the distribution status of the family in Brazil.

Methods

We studied 5 specimens of Pantophthalmidae housed at the Invertebrate Collection of the National Institute of Amazonian Research (INPA). All individuals were sampled in Roraima, the northernmost state of Brazil, whose territory includes the largest continuous areas of savannah in the Brazilian Amazon (Barbosa et al. 2005). Such phytophysognomy is locally known as “lavrado”, in reference to the widely open areas of the region that corresponds to approximately 27% of the state area. Further north and northwest, there are mountainous landscapes that include the Serra do Tepequém (Fig. 1) and the Serra da Mocidade (Fig. 2) (Carvalho et al. 2016). The climate of the region is tropical humid and dry, with annual average temperature around 28 °C and annual average precipitation of 1,600 mm (Barbosa and Miranda 2005). The season of low rainfall extends from October to March, whereas the high rainfall season ranges from April to September (Barbosa 1997).

The Serra da Mocidade (Fig. 1) is a very little studied federal conservation area. It is located in the municipality of Caracaraí in southwestern Roraima, covers an area of 350,960 ha and is best known for harbouring an isolated set of mountains of about 1,800 m in altitude near the border of the indigenous Yanomami area (Coelho et al. 2015). The area was legally established on April 29, 1998 with the aim of preserving natural ecosystems of great ecological relevance and scenic beauty (MMA 2016). The multidisciplinary expedition to this site was organized by the Chico Mendes Institute for Biodiversity Conservation (Rodrigues et al. 2017).



Figures 1, 2. Species collection sites of Pantophthalmidae. **1.** Serra da Mocidade, Caracaraí, Roraima, Brazil. Photo: Francisco F. Xavier Filho, 2016. **2.** Serra do Tepequém, Roraima, Brazil. Photo: Marlus Almeida, 2018.

The Serra do Tepequém (Fig. 2) is an atypical Amazonian environment for containing different types of savannah landscapes growing along valleys and slopes from gravel to sandy soils (Barbosa and Miranda 2005). Open fields with shrubs, sub-bushes and grasses form the vegetation. With a maximum altitude of about 1,100 meters (Neta et al. 2015), the mountain is a residual testament of ancient erosion surfaces, preserved in the midst of the dissected plateau of northern Amazonia.

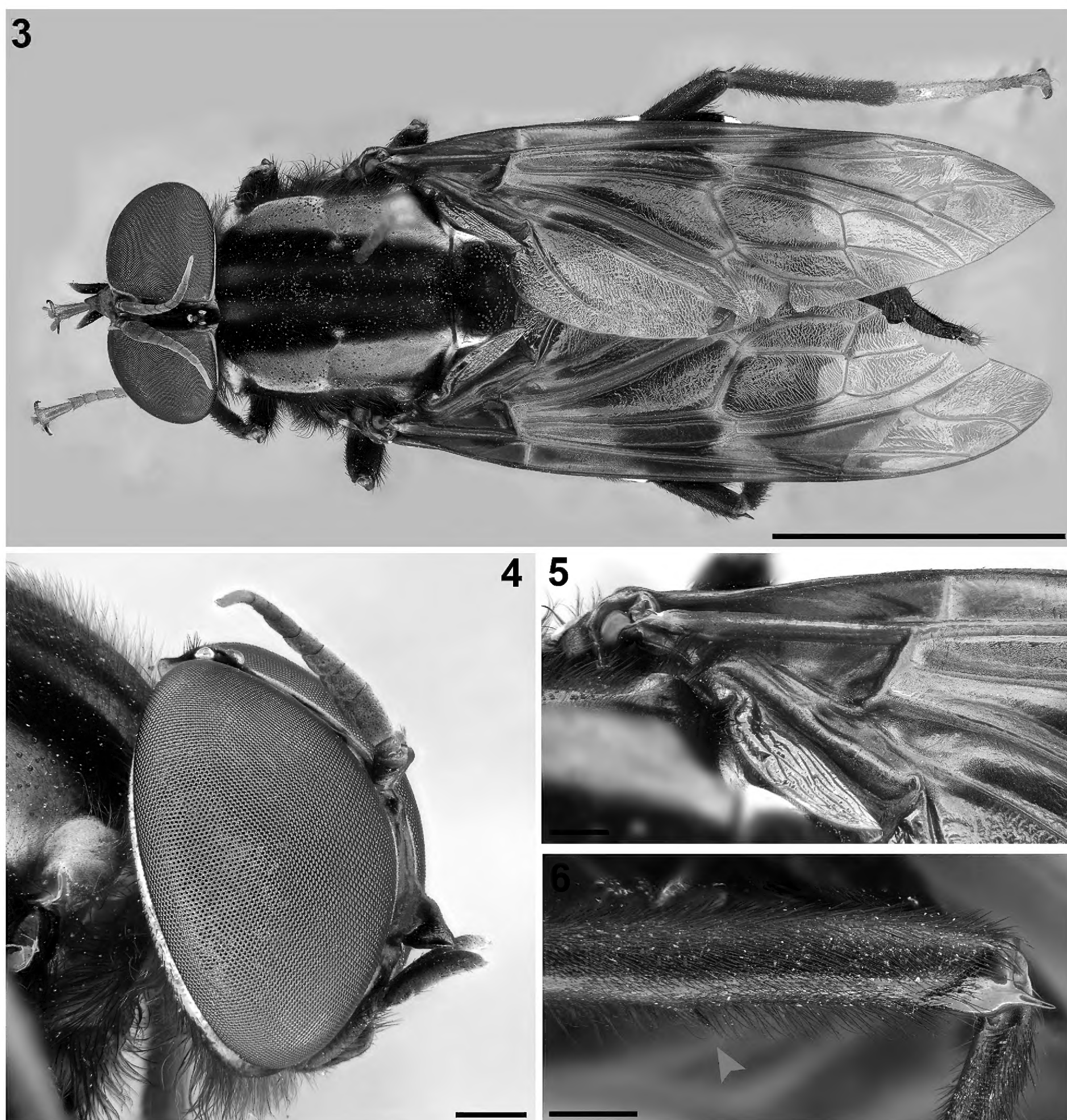
We used the taxonomic key by Val (1976) for species identifications. Specimens were photographed with a Leica MC170 HD digital camera on a Leica M165C stereomicroscope. The photographs were stacked and combined using Leica Application Suite V4.11. Map of occurrence was created with Simplemappr (Shorthouse 2010), using geographical coordinates from the specimen labels and bibliography. We used Google Earth® to locate the approximate collecting site for specimens without geographical coordinates. Square brackets were used to complement label information of the material examined. Asterisks in the section of geographical distribution represent new records.

Results

Pantophthalmus chuni (Enderlein, 1912)

Figures 3–6, 11

Acanthomera chuni Enderlein 1912: 102, 103, fig. 4. Type locality: Peru, Chanchamayo.



Figures 3–6. *Pantophthalmus chuni* (Enderlein, 1912). **3.** Dorsal habitus. **4.** Lateral view of head. **5.** Base of wing. **6.** Hind femur. Scale bars: 3 = 1 cm; 4–6 = 1 mm.

Diagnosis. Female: frons dark brown (Fig. 3); antenna dark brown, except yellow apical half of flagellomere 8 (Fig. 4); face with a very protruding and sharp beak (Fig. 4); scutum covered with small tubercles, whitish except for 2 dorsocentral stripes, 1 acrostichal stripe and postalar callus dark brown, dorsocentral stripe with a small whitish spot at the transverse suture level (seen under light in some specimens) (Fig. 3); scutellum dark brown, except for a large lateral whitish spot reaching the anterior margin; base of wing brown (Fig. 5); hind femur with ventral spine on apical one-third (Fig. 6); all abdominal tergites dark brown, except the whitish point on the lateral margin of the tergites 2–3.

Examined material. Brazil, Roraima, Caracarái, Serra

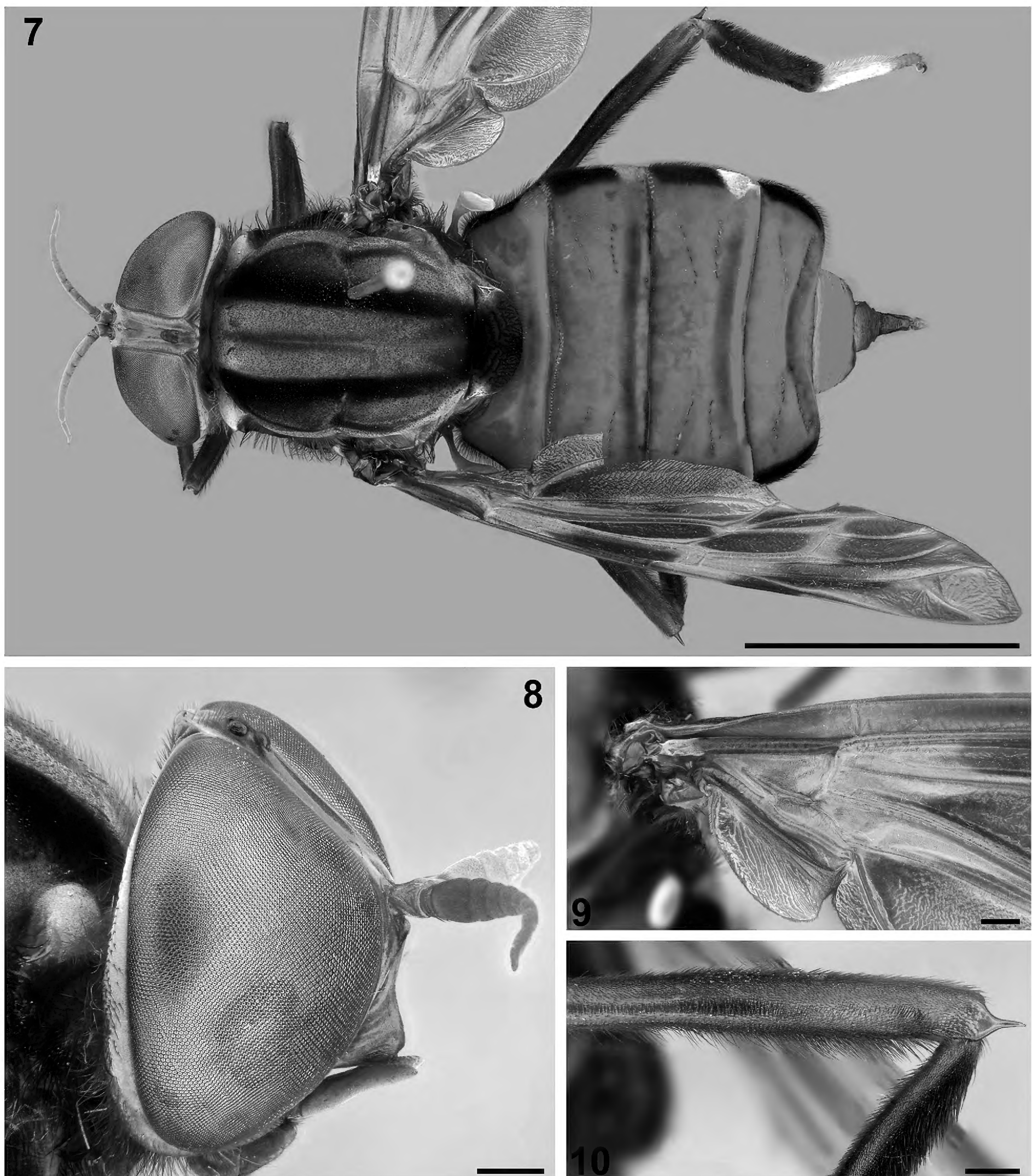
da Mocidade, 1050 m altitude, 01°42' N, 061°47' W, [fluorescent lamp] 25. i–06.ii.2016, M. Oliveira, F.F. Xavier, T. Mahlmann leg. (2 females); *idem*, Rede de Neblina [mist net], morcegos (1 female); *idem*, 600 m altitude, 01°36' N, 061°54' W, [Fluorescent lamp], 15–26. i.2016, F.F. Xavier, R. Boldrini, P. Barroso leg. (1 female).

Geographical distribution (Fig. 11). Argentina, Brazil (Amazonas, Pará and Roraima*), Bolivia, Colombia, Ecuador, French Guiana and Peru (Wolff et al. 2016, Fachin 2018).

Pantophthalmus comptus Enderlein, 1912

Figures 7–11

Pantophthalmus comptus Enderlein 1912: 107, 117. Type locality: South America.



Figures 7–10. *Pantophthalmus comptus* Enderlein, 1912. **7.** Dorsal habitus. **8.** Lateral view of head. **9.** Base of wing yellow. **10.** Hind femur without ventral spine. Scale bars: 7 = 1 cm; 8–10 = 1 mm.

Diagnosis. Female: antenna and frons orange yellow, covered with golden pruinescence (Fig. 7); face with a protruding and rounded beak (Fig. 8); scutum covered with small tubercles, with 2 black dorsocentral stripes, whitish region between stripes, except for median narrow golden stripe, pre-scutellar region with a brown triangular spot (Fig. 7); scutellum black, except for a whitish point on the lateral margin (Fig. 7); base of wing yellow (Fig. 9); hind femur without ventral spine (Fig. 10); abdominal tergites orange, except for apical margin

of tergites 1–4, apical half of tergite 6 and tergites 7 and 8 dark brown; tergites 2 and 3 with whitish spots on lateral margin (Fig. 7).

Examined material. Brazil, RR [Roraima], Amajari, Tepequém, SESC, 03°44'45" N, 061°43'40" W, 1–15. i.2016, Malaise [Trap], R. Boldrini & J.A. Rafael (1 female).

Geographical distribution (Fig. 11). Belize, Brazil (Amazonas, Pará and Roraima*), Colombia, French Guiana, Guyana, Peru and Surinam (Val 1976, Wolff et al. 2016).

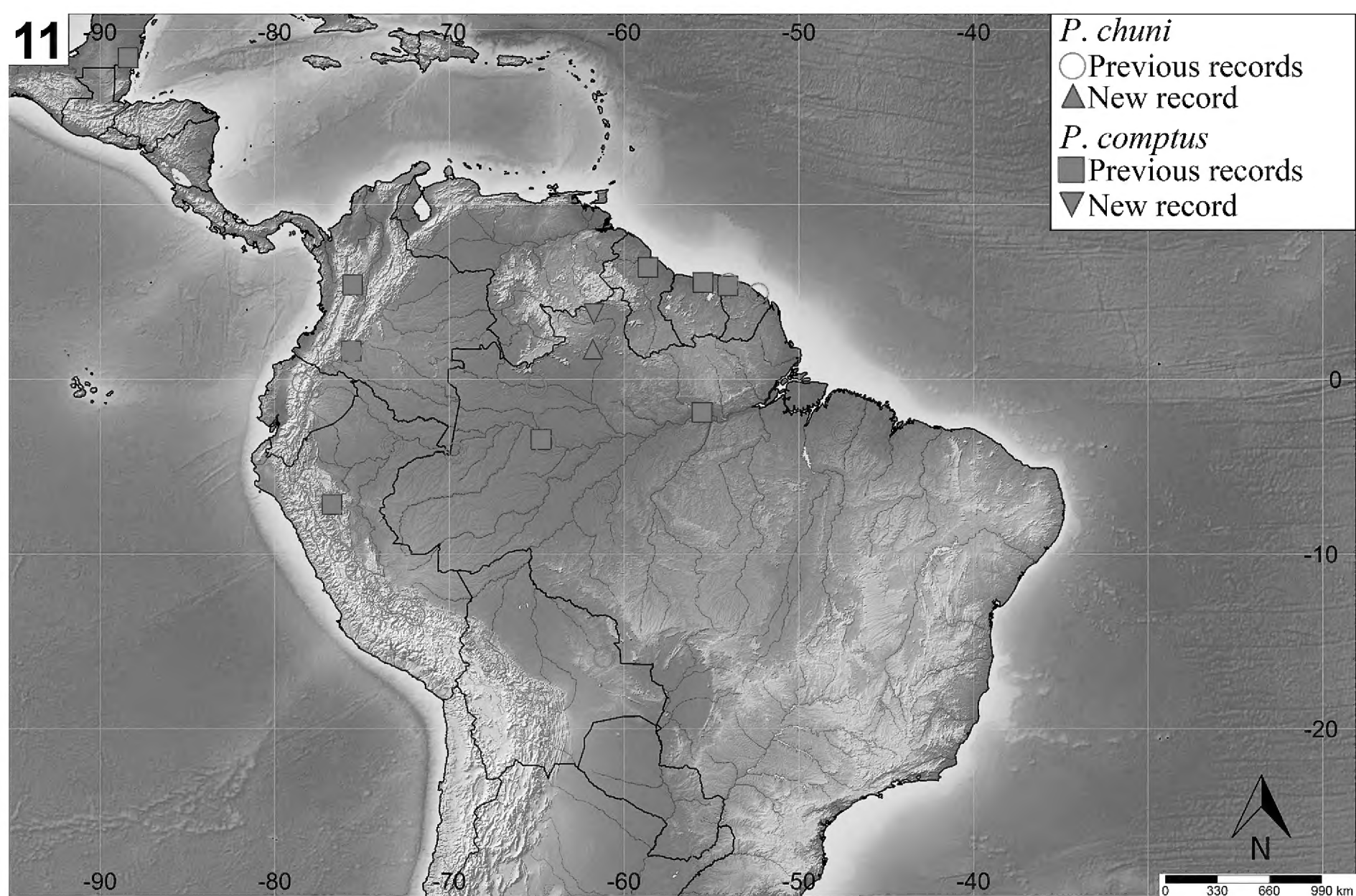


Figure 11. Geographical records of *Pantophthalmus chuni* (Enderlein, 1912) and *Pantophthalmus comptus* Enderlein, 1912.

Discussion

In this contribution, the distribution of Pantophthalmidae was expanded to the extreme north of Brazil. Now, the family is recorded for all states in the Northern Region of Brazil, except for Tocantins. The distribution of *Pantophthalmus comptus*, which was already recorded from the Amazon biome (states of Amazonas and Pará), now includes the ecoregion of Savannah in Roraima.

Three specimens of *P. chuni* from Serra da Mocidade were collected on the fluorescent lamps of the campsite, thus reiterating the assumption that this species is attracted to light (Val 1976). Due to its large size, one specimen was accidentally captured by a mist net used for sampling birds and bats.

Miranda and Absy (2000) and Barbosa et al. (2005) elaborated lists of plant species catalogued in Roraima, many of which are acknowledged host families for Pantophthalmidae. For example, *Pantophthalmus bellardi* (Bigot, 1862) uses Sterculiaceae, *P. kerteszi* (Enderlein, 1914) grows in Euphorbiaceae, *P. pictus* (Wiedemann, 1821) feeds on Fabaceae, Lauraceae, Moraceae, Sapotaceae and Myrtaceae, and both *P. tabaninus* (Thunberg, 1819) and *P. vittatus* (Wiedemann, 1828) use Anacardiaceae and Moraceae (Val 1976, Papavero 2009). Despite the occurrence of these families in Roraima, only one species of Fabaceae, *Schizolobium parahyba* (Vell) S. F. Blake var. *amazonicum* (Huber ex Ducke) is a confirmed host for *P. chuni* (Lunz et al. 2010).

There is no information yet regarding host plants of

P. comptus (Val 1976, Papavero 2009). As of now, the only records of Pantophthalmidae in Roraima are *P. chuni* and *P. comptus* recorded here. However, as host plants of other timber fly species are found in Roraima, the probability of detecting more pantophthalmids should increase if greater sampling initiatives are developed in the area. Timber flies have been rarely collected insects, thus their taxonomic and ecological information remains limited. It is desirable to carry out additional surveys with the aid of luminous traps, in addition to the active search for the host plants of the family.

Acknowledgements

We thank the Expedition “Biodiversity of the Serra da Mocidade”, the result of a collaboration between the Instituto Nacional de Pesquisas da Amazônia (INPA), Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio), Comando Militar da Amazônia (CMA), and Grifa Filmes. We also thank the curator of INPA, Marcio Luiz de Oliveira for kindly lending the material for study; Diego Aguilar Fachin for confirming the specimens identification; technician Francisco F. Xavier Filho and PhD student Marlus Almeida for photographs of Serra da Mocidade and Tepequém. LMB and MMMS thank the Coordenação de Aperfeiçoamento de Pessoal de Ensino Superior (CAPES) for the PhD scholarships. RAR thanks Conselho Nacional de Pesquisas (CNPq) for the PQ fellowship.

Authors' Contributions

LMB identified the specimens and wrote the manuscript. MMMS produced the photographs, map and wrote the manuscript. RAR wrote the manuscript.

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